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I. GENERAL INFORMATION

HYBRID RICE ACHIEVEMENTS REVIEWED

Shanghai WEN HUI BAO in Chinese 7 May 81 p 1

[Text] Correspondent Yao Shihuang [1202 6108 3552] reports, on 6 May from Changsha, that China's agricultural scientists and technologists have become the first in the world to succeed in breeding out hybrid rice with strong heterosis. Several years of experimental planting, followed by extention to large areas nationwide, has produced gigantic economic benefits. The reporter learned from concerned departments that the results from this scientific research have proved to be a major breakthrough. The State Science and Technology Commission has been informed of this.

This hybrid rice has very well developed root system, strong tillering characterisitcs, strong stems, large panicles, and numerous grains of good quality. It is broadly adaptable and has strong resistance to adversity. A new way has been opened up for a large scale increase of rice production. In the 50's and 60's, there were scientists in the USA and Japan carrying out research on hybrid rice, but none succeeded in using hybrid rice in production. Scientists and teachers of Hunan Provincial Academy of Agricultural Sciences, Qianyang Prefectural School of Agriculture, Hejiashan Seed Farm, Hunan Teachers College, and Hunan College of Agriculture began the research project on this subject in the 60's and by the early 70's; concerned scientific units in Jiangxi, Guangxi, Guangdong, Liaoning, and Xinjiang Provinces also joined the program. A great breakthrough was obtained in 1973 when the first batch of hybrid rice seeds were produced and, a set of seed preparation and cultivation techniques were summarized which allow hybrid rice to be quickly extended over large areas throughout the country. In the later part of the 70's, a breakthrough was also obtained in the hybridization of geng rice and its extension began in the rice region of North China. According to statistics : concerned departments, from 1976 to 1980, the accumulative total hybrid rice area in the country has reached more than 250,000,000 mu resulting in a yield increase of 26-27 billion jin of grain. Compared with other superior rice varieties, the average unit yield increase is more than 100 jin per mu.

There has been very little capital investment in the research and extension of hybrid rice while the economic benefits are very obvious. To use Hunan Province as an example, in the last 5 years, due to large area extension of hybrid rice, the accumulative total net increase of paddy is more than 7 billion jin which is equal to an increase in income of 700 million yuan. The investment by the State for the research of that item was only about 1,420,000 yuan. With an additional 30 million yuan of expense for popularization, the economical benefit is the equivalent of one yuan of investment for a grain of 23 yuan.

The success and rapid extension of this important fruit of scientific research has brought China's level of rice culture to a new height and has attracted international attention. In 1980, China transferred the technical patent for hybrid rice to the USA. In Hunan Provincial Academy of Agricultural Sciences, an international hybrid rice training class was organized for high ranking specialists of five Southeast Asian nations, under the auspices of the International Rice Research Institute. The scientists of the Hunan Provincial Academy of Agricultural Sciences were also invited to the International Rice Research Institute and the USA for cooperative research, lecturing, and technical guidance. At present, scientists are continuing the attempt to bring about a breakthrough in hybridization of early rice, the breeding of a late geng rice with high heterosis, the improvement of combining abilities of existing hybrids, and a further increase of products in seed propagation [of hybrids.]

6168
CSO: 4007/408

PROMPT SHIPPING, STORAGE OF GRAIN URGED

Storage Problems Delay Grain Shipments

Beijing REMIN RIBAO in Chinese 17 May 81 p 3

[Text] Last year, unprecedented big bumper harvests were obtained by 14 state farms under the Mudanjiang State Farm Management Bureau. The bureau's total output of grain and soybeans was 1,058,000,000 jin. In addition to 856 state farms delivered an average of more than 22,000 jin of grain and soybeans per farm worker, there were also five state farms which delivered more than 14,000 jin of grain and soybeans per farm workers. Every farm netted a profit. The profit of the entire bureau was about 80,877,000 yuan. The bumper harvest of grains brought great difficulty to the farms and [military] companies, however. To this day, there are 41,932 tons of undelivered grain and soybeans kept too long in stock in the yards of the companies.

This is the busy season of plowing and preparation, yet grains and soybeans are still all over the yards. In some farms, there is no space for the vehicles to turn around. If this problem is not resolved, the preparation for spring plowing and planting will be obstructed. Moreover, as the temperature rises, the oil production rate of the soybeans will drop. If the storage method is not proper, the soybeans will mold and rot and a whole year's hard work will be for nothing. The masses and cadres are extremely worried.

Department of Propaganda, Mudanjiang State Farm Management Bureau, Heilongjiang Province, Li Yong [2621 0516]

Grain Not Delivered

Beijing REMIN RIBAO in Chinese 17 May 81 p 3

[Text] After more than 20 years of hard struggle, the vast wasteland of the reclamation district has all been turned into good farms, while the district has also begun to change from a losing enterprise to a profitable one. Now, another difficulty has occurred: The grain harvest last year cannot be delivered to this day.

This is now the busy season of spring plowing. We have to start planting. Some workers are saying: "Harvesting grain is like committing a crime. There is no where to deliver it. The local granary will not accept it. Selling it is not allowed. This large quantity of grain is exposed in the yard, being blown in the wind and soaked in the rain. Our hard work of a whole year is just being wasted like that. Our farm alone has more than 6,000 tons of grain that has no where to go. The quantity is much greater for the entire reclamation district."

We are writing to you about this condition. We hope something can be done for us who plow the land. Tell us what should we do?

Yunshan Farm, Heilongjiang Province, Wang Yingquan [3769 5391 5425]

Grain-Drying Equipment Needed

Beijing REMIN RIBAO in Chinese 17 May 81 p 3

[Article by Chen Jinmian [7115 6855 2758] of Ningbo Municipal Bureau of Grains, Zhejiang Province]

The season for harvesting barley and rapeseed in Ningbo Prefecture is here. There has been a lot of rain lately and some workers of our grain department have been worrying: "If rainy days continue like this and there is not enough drying equipment, the grain and oil-seeds that are on hand will be lost, and the quality of the grain and oil-seeds that have been purchased and stored [by the state] will be affected as well.

Last year, it rained and rained during the early rice harvest. All production teams that had no drying equipment, suffered various degrees of losses from the dampness and mold. The total loss of rice in the suburbs was more than 10 million jin. The peasants said that food that was almost in the mouth was allowed to get away. Meanwhile, the early grain in the granary of the grain department had a high ratio of sprouted grains. A large quantity had turned yellow and deteriorated to affect the quality of the rice products of the mills. To this day, the residents are still complaining about the supply at the grain stations.

We suggest that the concerned departments supply us with grain and oil-seed drying equipment as soon as possible.

6168

CSO: 4007/408

PRODUCTION, SALE OF EDIBLE OIL AT ALL TIME HIGH

Beijing ZHONGGUO CAIMAO BAO [CHINA FINANCE AND TRADE JOURNAL] in Chinese 21 May 81
p 1

[Article: "Our Nation's Production and Sale of Edible Oil Are Undergoing Historical Change; Inventory Has Surpassed the Highest Level in History and the People Will Not Have to Consume Any More Imported Edible Oil; the Time Is Near to Restore Our Nation's Traditional Position of Being an Exporting Nation of Edible Oil"]

[Text] Report by reporter Tang Youren [3281 2589 0117]: our nation's production and sale of edible oil are undergoing historical change.

Our nation was once a traditional edible oil exporting nation. During the 1950's, the entire nation exported an annual average of 480 million jin of edible oil. The largest amount of annual exports reached over 600 million jin. Later, because of the influence of the mistaken guidance of the "left", the production of edible oils lingered and did not progress, and since 1976, imported edible oil has been consumed. Since the Third Plenum of the Party, each locality has conscientiously implemented the economic policy in farm villages, implemented many forms of the responsibility system in agricultural production, appropriately increased the procurement price of edible oils and the scale of markups on surplus procurement, the enthusiasm for production of the farmers has been mobilized, and large increases in the yield of oil bearing crops have continued for 3 years. In 1978, the total yield of oil bearing crops converted to edible oil reached 4.13 billion jin, surpassing the highest historical record of 3.9 billion of the 1950's for the first time. In 1979, this continued to increase to 4.93 billion jin. In 1980, this again increased to 5.5 billion jin, a net increase of 2.2 billion jin of edible oil over 1977, equivalent to two-thirds of the yield of this year. After the yield of edible oil rapidly increased, the amount of procurement by the state correspondingly increased. The consumption of edible oil by the people improved, and last year, the history of consuming imported edible oil ended. Now, the national inventory of edible oil has surpassed the highest level in history. According to forecasts by concerned departments, in the future, our nation's production of oil-bearing crops will continue to develop. In this way, on the basis of keeping a surplus balance of domestic edible oil, the amount of exports can be gradually increased and our nation's traditional position of being an exporting nation of edible oil will be regained in the near future.

9296
CSO: 4007/423

GUIZHOU PROVINCE LIVESTOCK PRODUCTION DEVELOPING

Beijing ZHONGGUO CAIMAO BAO [CHINA FINANCE AND TRADE JOURNAL] in Chinese 9 May 81 p 1

[Article by Li Tingjian [2621 1656 1017]: "Develop Agriculture, Forestry and Livestock Production Together; Propularize the Responsibility System in Raising Livestock; Guizhou's Six Livestock Animals Prosper"]

[Text] The various levels of the people's government of Guizhou Province have thoroughly implemented the guideline of developing agriculture, forestry, livestock production together and related policies. Many forms of responsibility systems in raising livestock have been widely implemented in farm villages, the enthusiasm for production of the farmers has been mobilized, and a prosperous situation of increased yields of food grains and prosperity of the six livestock animals have emerged.

In the first quarter of this year, according to statistics of Zhunyi, Kaiyang, Tondzi, Renhuai counties, the number of live hogs raised this year increased by more than 3 percent over the same period last year when greater increases had been realized. Mutton sheep increased 23 percent over the same period last year. The average number of large livestock raised per family reached 0.8 head. Now, most of the region of the province can basically open up supply of fresh eggs and pork and the prices are stable.

The great development of livestock production in Guizhou Province is the result of the establishment of versatile and many forms of responsibility systems in raising livestock, the in depth implementation of the spirit of the Third Plenum by the party and administrative leadership of each level, elimination of the influence of "leftist" ideology, correction of the past practice of forceful procurement from "the three fields" (private plots, feeding grounds, reclaimed land), closing down of livestock markets, limitations on raising, prohibition of raising large and small livestock and such mistaken practices. According to incomplete statistics of Tongren, Xingyi, Yinnan, Anshun, and Liupanshui regions, prefectures and cities, the number of privately raised cattle and horses has already reached over 150,000 head (horses).

The active support by the financial and trade departments also promoted the development of the livestock industry. According to the statistics of the 35 counties (cities) and the five regions (prefectures) of Anshun, Bijie, Tongren, Yinnan, Xingyi, for the past year, each locality used special funds subsidized by the state for poor counties and bank loans and added capital provided by commune members themselves to buy over 79,000 head of cattle and horses (breeding cattle and stud horses) and over 13,000 head of goats and sheep, and introduced and propagated over 60,000 long haired rabbits.

TENTATIVE PLAN FOR AGRICULTURAL ZONING DETAILED

Fuzhou FUJIAN NONGYE KEJI [FUJIAN AGRICULTURAL SCIENCE AND TECHNOLOGY] in Chinese
2 Sep 81 pp 17-20

[Article by Chen Xinyuan [7115 1800 3220] and Sun Zhenggui [3097 1767 6311] of the Fujian Provincial Academy of Agricultural Sciences: "A Tentative Plan for Agricultural Zoning in Fujian Province"]

[Text] Our province is situated on the southeastern coast of our nation, between 115° 30' and 120° 30' E longitude and 23° 30' and 28° 22' N latitude. It is near the Tropic of Cancer. The whole province has a total area of 12.17 million square kilometers. The area of cultivated land is 19.42 million mu, constituting 10.6 percent of the total area of the province. The average area of cultivated land per person is only 0.78 mu. The province is in the Subtropical Zone, the weather is warm, rainfall is abundant. The province is backed by mountains and faces the sea, mountains are tall, there are hilly regions intermixed with river valleys and basins. Mountain regions and hilly regions constitute over 90 percent of the area of the province. The growth of vegetation is rich and vegetation remains green throughout the seasons. It is one of our nation's important forest regions. The ocean coastline is long (over 4200 kilometers) and winding. There are many islands, many good natural harbors; the beaches and ocean zones are wide. The province is densely populated by rivers, small rivers, streams, creeks, and water conservancy resources are rich. Such superior natural environmental conditions of our province are favorable to the overall development of agriculture, forestry, livestock production, sideline production and fishery, and they are favorable to the development of tropical and subtropical crops. We are carrying out agricultural zoning based on the presently available data and preliminary surveys and studies. According to the characteristics of agricultural production, the zones should have a relative consistency, natural conditions and economic conditions, basically the same direction of development, major technical reform measures in agricultural production and should consider the question regarding the presence of agricultural production. The principle of basic consistency within the zones has led us to a preliminary and tentative plan of zoning the entire province into six comprehensive agricultural zones. Each zone is described in the following:

I. The Southeastern Coastal Zone of Dryland Crops, Fishery, Forestry and Fruit Production

This zone neighbors the Taiwan Strait on the east. It begins from Langzhidao at the mouth of the Minjiang in the north, connects with the southeastern plain of mainly paddy rice and economic crops in the west, and joins Guangdong Province in the south.

The zone includes 18 counties (cities) of hilly dryland crop areas and fishery areas and 1,404 islands of Pingtan, Nanri, Meizhou, Jingmen, Dongshan, forming a narrow and long strip. This zone covers about 10 million mu (according to classical calculations), constituting about 5.5 percent of the total area of the province. The area of cultivated land per member of the farming population is only about 0.6 mu (the higher average is about 1.0 mu, generally between 0.5 and 0.6 mu, the lower average is 0.1 to 0.2 mu). But the coastline is long and winding, the areas of fishing zones, shallow seas and beaches are large, they have been less developed and utilized, and their potential for developing fishery is great.

This zone belongs to the southern subtropical semi-arid climatic region. Heat resources are rich: the annual average temperature is between 19.0°C and 21.3°C. Sunshine is relatively sufficient, annual rainfall is 1000 to 1200 mm. Forest vegetation has been seriously destroyed and the percentage of covering by forests is low, loss of water and soil and wind erosion are serious, threats by aridity and wind and sand are great. The soil is mainly latosol type red soil and latosol red soil formed by differentiation and developed from granite. The main agricultural crops are dryland crops, sweet potato, peanuts, soybean, wheat, barley and peas. As protective forests are planted and as the water conservancy conditions improve, the area of paddy and dryland crop rotations has expanded. The planting system used to be mostly triple cropping in 2 years or five typings in 3 years. As some commune brigades improve along with improvements in water conservancy, the planting systems and the varieties used are also improving and are gradually developing into five typings in 2 years and seven typings in 3 years. Individual brigades such as the Yingxi Brigade in Fuqing County are producing 12 typings in 4 years. Animal husbandry and livestock production are not developed. There is a shortage in the supply of organic fertilizers and fuel. The foundation of industry and sideline production is poor and weak. There are many overseas Chinese who came from here and this zone is one of the important overseas Chinese regions of our province.

According to the characteristics of this zone, the direction of future agricultural development is: (1) to plant protective forests, forests to preserve water and soil, and forests for firewood in a big way, to reform the ecological environment and to conscientiously build water conservancy projects well, to fundamentally improve productive conditions and the conditions of the people's life; (2) to conscientiously grasp sweet potato well as the main crop in food grain production and at the same time to conscientiously produce dryland crops such as peanuts well to build this zone into our province's production base of oil bearing crops such as peanuts; (3) to develop fish culture and ocean fishery in a big way; (4) on the basis of building protective forests, to suit measures to local circumstances to develop oranges, pineapples and such fruits, in the south, the production of rubber and sisal hemp and such tropical economic crops can also be developed; (5) to fully utilize stems and stalks of crops to develop the raising of goats, pigs, cattle, ducks along the sea coast, and to increase the proportion of livestock production; (6) to develop salt production and other industrial and sideline production; (7) some islands can develop tourism and serve as rehabilitation areas (such as Chuanshidao at the mouth of the Minjiang).

II. The Zone of Food Grains and Economic Crops of the Southeastern Plain and Low Mountain Areas in Fujian

This region begins from Fuzhou and Changde in the north and extends south to Guangdong Province. It lies against the dryland crop region of the hilly area in southeastern

Fujian in the east (partially on the coast of the Taiwan Strait), and it reaches the foothills of Daiyun and Poping in the west. This zone covers about 40 million mu, constituting 21.9 percent of the total area of the province. The area of cultivated land is between 5 million and 5.5 million mu (the area of cultivated land in the plains is about 2.5 million mu), constituting between 25.7 and 28.3 percent of the total area of cultivated land in the province, averaging 4.0 and 4.2 mu per person or 0.5 to 0.6 mu of cultivated land per person (an average high of 0.7 to 0.8 mu and an average low of 0.3 to 0.5 mu). It is one of our province's important overseas Chinese areas.

Most of this zone belongs to the southern region of subtropical climate, conditions for agricultural production are good, heat resources are rich, the annual average temperature is between 19.3 - 21.3°C, the lowest average temperature is above 0°C, annual rainfall is between 1200 and 1700 mm, rainfall is abundant, sunshine is relatively sufficient. The topography is mainly characterized by plains and low hills. The plains are flat, rivers abound, irrigation and drainage are convenient. The soil is mostly paddy soil formed by alluvial deposits of rivers. A part of the soil is paddy soil developed from latosol type red soil or red soil. On the sea coast and at the mouths of rivers and bays there is saline soil of marine deposits. This zone has less land and more people, labor forces are sufficient, planting is relatively refined, the multiple planting index and the unit area yield are all relatively high. The major food grain crop is paddy rice, followed by barley, wheat and sweet potato. Of the economic crops, sugar cane covers a relatively large area, jute and tobacco also cover a definite area. Fruit trees include oranges, longan, litchi, banana, loquat, pineapple, pomelo, olive, and it is our province's major fruit producing region. In recent years, rubber, coffee, pepper, sisal hemp and such tropical crops have been planted successfully. They cover a definite area in the southern regions.

According to the characteristics of the natural and economic conditions of this zone and the need for national economic development, the direction of future development in agricultural production is: (1) to gradually readjust the internal structure of agriculture, and while grasping well food grain production of mainly paddy rice and increasing the unit area yield and improving the quality in a big way, to greatly develop the production of economic crops of sugar cane and to gradually establish this zone as our nation's production base of cane sugar; (2) to fully utilize the superiority of an abundant labor force to develop industrial and sideline production that is labor intensive and that has a high economic value (such as mushrooms, asparagus) in a big way, to develop commune and brigade enterprises in a big way, to actively export products to create foreign exchange, to increase income; (3) to develop the production of subtropical fruits such as oranges, longan, litchi, bananas, loquat, pineapple, and olives, to gradually establish the zone as a fruit production base; (4) to develop livestock production (raising hogs, raising dairy cows, raising ducks), fishery (including pisciculture and catching) production; (5) to suit measures to local circumstances in the southern regions to develop the production of rubber and such tropical crops; (6) to develop the famous ruins and the reservoirs and artificial lakes in this zone for tourism and as rehabilitation areas, and to develop fresh water culture in the reservoirs and artificial lakes.

III. The Northeast Coastal Zone of Food Grains, Forestry, Fishery and Tea Production

This zone is situated on the southeastern side of Tailao and Jiufeng mountain regions, including the six counties of Xiapu, Fuan, Ningde, Lucyuan, Lianjiang and east of

Guanyang in Fuding County in the Ningde region. The zone neighbors the Wenzhou region of Zhejiang Province in the north, connects with the southeastern plain and the low mountain farming regions of Fujian in the south, connects with the Jiufeng-Tailao forest, farming and tea regions in the west, and neighbors the East Sea in the east. The coastline is long and winding, there are natural harbors and fishing grounds, the aquatic resources are rich. Within the zone are low mountains, medium mountains, valleys and basins, the topography is relatively complex. The entire zone covers over 12.2 million mu of land, over 1.55 million mu of which are cultivated land, constituting about 8 percent of the area of cultivated land of the entire province. Each person averages 5.4 mu of land, or 0.69 mu of cultivated land. The climatic characteristics of this zone is warm, hot and humid weather, the summer is slightly longer, the winter is slightly shorter, autumn arrives slightly late. Heat resources are more abundant, annual average temperature is 18.0 - 19.3°C, the lowest average temperature is 0 - 4°C, annual rainfall is 1350 - 2000 mm. More rain falls over the inland area than along the coast. Within the zone, the mountains are generally more precipitous, differences in elevation are greater, the types of land are more complex. The soil is mostly red soil, yellow soil, red (yellow) surface submeric southern-paddy soil, cold spring paddy soil. In paddy fields, double season rice is the main crop, the land is mostly fallow in winter. Sweet potato is the main crop planted in dryland, unit yield is higher than the provincial average. The area used for forestry in this zone constitutes about 80 percent of the land, but the forests have been seriously damaged, there are not many expanses of forests, the threat of drought is relatively great. Tea production occupies an important position in our province. This zone is one of the province's three major tea regions, but forests for firewood are dwindling. The areas of shallow sea and beaches are large and the potential for developing fishery is great.

The direction of future development of agricultural production in this zone is:

- (1) to greatly develop pisciculture in seas and along beaches, to develop ocean catching, to build the zone into a fishery production base of our province;
- (2) to greatly increase unit area yield in grasping well the production of food grains (paddy rice, sweet potato), oil bearing crops (rape, oil tea camelia) so that there will be self sufficiency and surplus and at the same time, to develop tea production in a big way to gradually establish this zone as our province's tea production base;
- (3) to strengthen forestation and greening in a big way, to increase the percentage of coverage by forests, to increase accumulation of timber, to strengthen water and soil preservation, to protect and develop hydraulic power resources to serve the development of industry and agriculture and the life of the masses;
- (4) to develop hog, cattle, rabbit, and duck raising and such livestock production.

IV. The Northeastern Zone of Forestry, Food Grain and Tea Production in Jiufeng and Tailao

This zone includes the eastern part of Shouning, Zhouning, Pingnan, Zhenghe counties and the broad mountain region in the western part of Fuding County. The area of land is about 8 million mu, constituting 4.5 percent of the land of the entire province. The area of cultivated land is about 700,000 to 800,000 mu. Average area per person is 1.15 mu. The elevation is relatively high, the weather is colder, the annual average temperature is 12 - 16°C, the lowest average temperature is -6°C, reaching -15°C on high mountains. There are 28 to 30 days of freezing and ice, annual rainfall is 1800 to 2000 mm, there are many foggy days and dampness. The number of hours of

sunshine a year is below 1800 hours. The zone is suitable for the production of forest wood and tea. The main agricultural crop is single season rice. Sweet potato and potato cover a definite area.

The direction of development of agricultural production in this zone in the future is: (1) to implement the policy of "taking forestry as the main task", to greatly develop forestry production, to gradually build this zone into our province's production base of economic forests of timber and oil tea camelia and tung oil trees; (2) to plant single season rice, sweet potato and such food grain crops well, to greatly increase unit area yield, to actively develop potato and green manure so that the zone can be self sufficient in food grains; (3) to greatly develop tea production, gradually built the zone into our province's tea production base; (4) to develop cattle, hog, sheep, geese, and rabbit raising and such livestock production; (5) to develop specialty products of the mountain regions such as Chinese herbal medicines and mushrooms, dried bamboo shoots.

V. The Northwestern Inland Zone of Food Grain, Forestry, Livestock Production, Tea and Fruit Production

This zone is between the two mountain ranges of Wuyishan and Daiyunshan. It is slightly to the north in latitude. It includes the two regions of Jianyang and Shanning, and Gutian County of the Ningde Region, Minqing and Yongtai counties of the Putian Region. It is connected to Zhejiang Province by Xianxialing in the north, borders Jiangxi along the divide of the Wuyishan range in the west, neighbors the forest and tea regions of the northeastern mountains of Fujian along Jiufengshan in the east, to the southeast it connects with the low mountainous farming regions of the southeastern plains of Fujian via Daiyunshan, and in the south it connects with the southwestern farming regions of Fujian. It is our province's largest comprehensive agricultural zone. It covers over 83 million mu in area, constituting 45.46 percent of the area of land of the entire province. The area of cultivated land is over 6.9 million mu, constituting 35.46 percent of the cultivated land of the entire province, average area of land per person is 15.51 mu, average area of cultivated land per person is 1.29 mu. The climate of this zone is warm and damp, annual average temperature is 16.0 - 19.5°C, the lowest average temperature is 2 - 6°C. Rainfall is abundant, annual rainfall is 1520 - 2000 mm. The annual number of hours of sunshine is 1700 - 2000 hours. The major soil type is red soil, above an elevation of 600 - 700 meters, the soil is mostly yellow soil. The soil of cultivated land is mainly paddy soil, there are also muddy clay soil, red (yellow) surface submergic southern paddy soil and cold spring paddy soil. Natural vegetation is mostly central and subtropical green broadleaf forests, there are also mixed evergreen coniferous forests and broadleaf forests and evergreen coniferous forests. Originally, the forest resources were rich but they were seriously destroyed. Paddy rice is the main agricultural crop, there are many flat submerged fields and mountain ridge fields and mountain terrace fields at low and medium elevations, double season rice covers a definite area. This zone is our province's main commercial food grain base. Tea occupies a definite proportion, and in recent years, oranges have developed.

The climatic conditions of this zone is better, the area of land is larger, there is more labor force. This zone has good conditions for developing agricultural, forestry, livestock and sideline production. The direction of development of agricultural production in the future is: (1) to greatly develop forestry production and gradually build the zone into our province's economic forest and timber production base, mainly

China fir and bamboo and oil tea camelia; (2) to strengthen food grain production in a big way, conscientiously do well basic construction in agriculture centered around the control of water and improvement of soil to build superior fields that will produce an assured harvest in drought or waterlogged conditions and high and stable yields so that this zone will become our province's commercial products production base; (3) to strengthen the production of tea and fruit trees; (4) to strengthen hog, cattle, and sheep raising and livestock production and increase the proportion of livestock production; (5) to develop sideline production and handicraft and specialty products of mountain regions such as Fujian lotus, mushrooms, dried bamboo shoots, resin, medicinal herbs.

VI. The Southwestern Inland Zone of Forestry, Tea, Tobacco and Fruit Production

This zone is located between the two mountain ranges of the southern section of Wuyishan and Bopingling. It is slightly towards the south in latitude. It includes the seven counties in the Longyan Region. Its topography is mainly characterized by medium mountains, low mountains and basins and valleys. Its land phase and elevation are higher than the farming regions of northern Fujian. The entire zone has over 29 million mu of land, constituting 15.88 percent of the area of land of the entire province. It has over 2.08 million mu of cultivated land, constituting 10.7 percent of the province's area of cultivated land. The average area of land per person is 13.68 mu, average area of cultivated land per person is 0.98 mu. It is an area of our province with a larger average area of cultivated land per person, a larger area of forests, and richer mountain and forest resources. The climate is warm, hot and damp, annual average temperature is 18 - 20°C, the lowest average temperature is -2.0 to -4.0°C, the wintering conditions for thermophilous crops are not as good as those in the southeastern farming region, but rain and heat come at the same time, favorable for the growth of such agricultural crops as paddy rice and fir, bamboo and tea trees. Water conservancy resources are rich, but the forests at some places have been destroyed and loss of water and soil is more serious. Minerals are rich and handicraft and specialty products of the mountain regions are rich.

The direction of agricultural production of this zone in the future is: (1) to greatly strengthen forestry production, mainly by artificial forestation, to hasten the establishment of this zone as a timber base mainly of fir forests and as a base of woody oil bearing trees mainly of oil tea camelia, and to develop the production of tung oil, lacquer tree, palm, shellac, resin according to plans; (2) to strengthen basic construction of farmland, to establish superior fields that produce an assured harvest in drought and waterlogged conditions and that produce high and stable yields, to grasp well the production of food grains, to greatly increase the unit area yield to realize self sufficiency and surplus in food grains and to strive to make contributions to the state; (3) to develop the production of tea, fruits, tobacco and other economic crops according to plans; (4) to develop livestock production and establish this zone as a feed base, to increase the supply of feed, to improve management of feed so that livestock production will develop to a greater extent; (5) to fully utilize the favorable conditions of the rich southwestern mineral resources and the rich resources of handicraft and specialty products of the mountain regions, to open up more ways for production, to develop industrial and sideline production.

The above idea of zoning is a rather rough description because of an insufficient grasp of information, for example, the Baiyunshan range and Bopingling should be included in a separate zone, and below the primary zones there should be secondary zones to facilitate production plans, but because of insufficient investigation and study, further studies and additions are needed.

COMMENTATOR URGES INCREASED SUGAR CANE PRODUCTION

Guangzhou NANFANG RIBAO in Chinese 19 May 81 p 1

[Article by Staff Commentator: "Exert Efforts to Create a New Level in the Production of Sugar This Year"]

[Text] Last year, our province's cane sugar production surpassed the highest level in history in unit yield, total yield and sugar production even when the planting area was less than that of the year before by 180,000 mu. This is encouraging good news on the agricultural battle front of our province. Now, the various localities have already completed the plan for spring planting of sugar cane with surplus. We must continue our efforts to manage sugar cane well and strive to create a new level in the production of cane sugar.

Last year, the basic numbers in the production of sugar cane were relatively high. Can they be surpassed this year? The answer should be affirmative. At present, our province's cane sugar production trend is very good, there are many favorable conditions for increasing yield. In recent years, the Party Central Committee, the State Council and the provincial committee and the provincial people's government have established a series of policies concerning sugar cane production, and they have served greatly to excite the enthusiasm of the broad masses of farmers to plant sugar cane. This year, more sugar cane has been planted than any other year in the past, total area has reached 3.25 million mu, more than the actually harvested area of last year by 830,000 mu, sixty percent are paddy field sugar cane plantations, and the chance of increased yields is greater. It must be especially pointed out that because each locality has implemented the various forms of the joint production responsibility system, the production of sugar cane has been linked directly to the economic benefits of commune members, therefore at most places, the quality of sugar cane is better, management is fine, and the growth of spring planted sugar cane, autumn planted sugar cane and ratoon sugar cane is better than past years. According to correct calculations by concerned departments, even if the average per mu yield of industrial raw material sugar cane is maintained at last year's level of 3.7 tons, this year will produce an increase of 3.07 million tons of sugar cane, thus 300,000 tons more of sugar can be produced in general. The good situation in sugar cane production this year has not been seen before. As long as we fully utilize the favorable conditions, overcome unfavorable factors that may possibly occur, seizing bumper harvests of sugar cane this year is very hopeful.

To create a new level in the production of cane sugar this year, the key is to stabilize and realize the various policies concerning cane sugar issued by the Central Committee and the province to further mobilize the enthusiasm of the sugar cane farmers to manage sugar cane well. Since last year, our province promulgated and implemented subsidies above established prices and partial return of profits per ton of sugar and per ton of food grains beyond the basic quotas and such a series of concrete policies and economic measures in the spirit of the policy of the Central Committee and won the confidence of the people. Because of these policies and measures, the farmers saw that planting sugar cane brought benefits to the state, the collective and the individual, and they thought of many ways to plant sugar cane well, thus large increases in yield of sugar cane was realized last year even when the area throughout the province decreased. Now, sugar cane has produced bumper harvests, the yield of cane sugar has increased. We must firmly implement the policies to win the confidence of the people, we must never act stupidly again by "changing the policy when the situation has improved." At the same time, we must rapidly hand over to the masses the concrete procedures and detailed regulations concerning the final accounting for rewards of food grains (fertilizers) for surplus cane sugar of this year so that the masses will be "pacified" and will do their work in a big way in the new year. At present, some localities and departments are unwilling to fulfill promises under the various established policies by making excuses that right now the forms of management and operation at some localities are undergoing change. This has planted doubts in the minds of the masses about the stability of the policies. This situation is worth our attention and must be corrected.

We must announce in a loud voice: policies established last year must be fulfilled. In implementing the policy of a ton of sugar and a ton of food grains, implementation of the policy over the course of 5 years must not be changed. Even if some concrete details have to be simplified because they are too tedious, they can only be perfected and be made more favorable to mobilizing the enthusiasm of the masses. They must not be changed constantly, thus discouraging the enthusiasm of the masses.

To enable this year's cane sugar production to reach a new level, the technical guidance in scientific planting of sugar cane must be conscientiously strengthened and field management must be done well. At present, the following three aspects must be grasped well: one is to inspect and supplement the seedlings well and to apply tillering fertilizers well, to exert efforts to increase the effective number of canes per mu; the second is to dig trenches to drain away the accumulation of water, to prevent disease and insect damage; the third is to apply and supply fertilizers well, in particular, sources of fertilizers must be widely opened up to solve the problem of fertilizers for expanded planting of sugar cane. Last winter and this spring, the temperatures have been slightly higher, and recently there has been more rain, insect damage has been serious, and this has brought about unfavorable effects upon the growth of sugar cane. We must establish the ideology of resisting disasters and seizing bumper harvests and carry out each management job more carefully to assure increased yields.

The production level of sugar cane of each locality of our province and the form of management are different, attention must be paid to suiting measures to local circumstances, and guidance must be separated by category. Comrades of each level

of leadership must go deeply into the basic levels, carry out surveys and studies, discover problems in time, solve the problems, lead the masses in doing the work of scientific planting of sugar cane well, exert efforts to increase unit yields. Communes and brigades implementing the contract system of contracting production and contracting work by the families must also strengthen technical guidance to popularize scientific techniques and knowledge of planting sugar cane to all families. In addition, to do well the work of seasonal production of processing sugar cane during the next fiscal year, construction of sugar refineries that have been approved for building must be started quickly. Each sugar refinery must sign contracts with communes and brigades now to arrange the work of felling, transportation and pressing work early. Communes and brigades far away from sugar refineries and engaging in self-production of sugar must also prepare for indigenous pressing work early and well.

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TAISHAN COUNTY EXPANDS SUGAR CANE, MULBERRY AREAS

Guangzhou NANFANG RIBAO in Chinese 18 May 81 p 1

[Article by Tao Guangyuan [7118 0342 0337] and Li Kexhen [2621 0344 4176]: "Develop the Superiority of Many Mountains and Expansive Seas to Do Diversification Well; Taishan County Has Expanded the Planting Area of Sugar Cane and Mulberry Trees by Nearly Onefold This Year, Forestry and Fishery Production Have Also Realized New Development"]

[Text] Taishan County has developed the superiority of the locality of more mountains and more expansive seas under the prerequisite of assuring the total yield of food grains will continue to increase and it has greatly developed economic crops and forestry, livestock production, sideline production and fishery production. This year, the planting area of sugar cane and mulberry trees increased nearly onefold over last year, the planting area of peanuts increased 20,000 mu, forestation covered 150,000 mu, and tea, oranges, watermelon and vegetables and such economic crops also developed relatively greatly.

Taishan County has 1 million mu of cultivated land, 2.7 million mu of mountain land, 449 kilometers of coastline, and it is a good place to develop agriculture, forestry, livestock production and fishery. In the past, under the mistaken ideological influence of the "left," diversification frequently was criticized as capitalism, the slopeland originally suitable for planting peanuts was used to plant paddy rice, ocean beaches suitable for pisciculture were changed to paddy fields, and as a result, the collective had nothing and the commune members were poor. Per capita distribution throughout the province remained at about 80 yuan for many years.

After the Party's Third Plenum, especially since last year, Taishan County has rationally readjusted crop distribution on the basis of in-depth investigations and study, besides changing the slopeland and sea coasts unsuitable for planting paddy rice to planting peanuts and fish ponds, the original area of paddy rice was also appropriately readjusted. Last year, sugar cane was planted in over 40,000 mu throughout the province, peanuts were planted over more than 80,000 mu, mulberry trees covering more than 5,000 mu were newly planted. At the same time, watermelon, potatoes, oranges, vegetables and such economic crops have been actively developed. Because the distribution is more rational, food grain crops and economic crops mutually promote each other, and because of the popular implementation of various forms of the production responsibility system, the enthusiasm

for production of the farmers has been mobilized, and as a result, even though the area of food grain crops has decreased, the total yield of paddy rice throughout the county still surpassed that of 1979 by over 80 million jin, and per mu yield surpassed 1,000 jin for the first time. Diversification also developed to a greater extent, large bumper harvests were realized in peanuts, sugar cane, watermelon, potatoes, vegetables, and increased production of hogs, cattle, sheep and chickens was also realized. Total production value of commune and brigade enterprises reached over 104.6 million yuan, an increase of 53.2 percent over the previous year, and a profit of 12.2 million yuan was realized, an increase of 61 percent. Because of the development of diversification, the inventory of the collective, distribution to the commune members and contributions to the state throughout the province all increased on a large scale. Last year, the per capita distribution at the production team level throughout the province reached 122 yuan, an increase of 31 yuan over the previous year.

Taishan County saw in last year's practice the superiority of diversification and comprehensive development, it saw the direction of progress. This year, the county committee has mobilized each commune brigade to continue to greatly develop diversification. Throughout the province, besides developing peanuts and sugar cane and such economic crops, it has also conscientiously paid attention to doing forestry production well. This year, the entire county has planted 150,000 mu of *pinus elliottii*. At the same time, it has developed over 5,000 mu of tea plantations. In fishery production, besides grasping well ocean fishing, it has also controlled over 100,000 mu of encircled saline land along the sea coast according to plan to develop cultivation of fish, shrimp, crab and oysters. Many of the masses said: "Doing things in this way, Taishan will have big hopes!"

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WHEAT SOWING PLAN OVERFULFILLED

Harbin HEILONGJIANG RIBAO in Chinese 7 May 81 p 1

[Article by Wang Fengqi (3769 7685 1477): "Grasp Favorable Opportunities to Fully Develop the Function of Machines; Our Province Overfulfills Wheat Sowing Task; 31.6 Million Mu Have Already Been Sown, Surpassing the Plan by 600,000 Mu; At Present, Wheat Sowing Is Still Being Carried Out in Some Northern Farms and Brigades"]

[Text] The province's wheat sowing task of this year has been victoriously completed. As of 5 May, 31.6 million mu of wheat have already been sown, more than the plan by 600,000 mu, surpassing last year's planting area which was the largest in history. At present, wheat sowing work is still being carried out in some of the state-run farms and commune brigades in the north and wheat planted early in the south has already become green.

This year, our province's wheat was sown under conditions of waterlogging in the east and drought in the west. When sowing wheat began, over 60 percent of the area for sowing wheat in the east was waterlogged. In the west, over 2 million mu of wheat fields was affected by drought. Throughout the province, the wheat sowing time began 5 to 7 days later than past years. By the middle 10 days of April, temperature throughout the province rose, the soil quickly became thick, each locality grasped the opportunity and fully developed the function of machines. Daily progress of wheat sowing hastened greatly. Each day, 1.068 million mu were sown. The progress was faster than that of last year by over 70 percent. Therefore, although wheat sowing started later than last year, the basic time of conclusion of wheat sowing this year was about 10 days earlier than last year. The area of wheat planted within the bumper harvest period constituted 83 percent, more than last year by 11 percent. The sowing period was concentrated, and the harvesting period will also be concentrated, this is the outstanding point of this year's wheat production.

After sowing wheat, most of the localities welcomed two spring rains, which are very beneficial to the germination and growth of wheat. Wheat seedlings that have already emerged are uniform and fresh.

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READJUSTMENT OF COMMUNE, BRIGADE ENTERPRISE

Beijing RENMIN RIBAO in Chinese 20 May 81 p 2

[Text] Commune and brigade enterprises of Heilongjiang Province are seriously implementing readjustment policies so as to develop such enterprises as agricultural by-products processing and light industries to serve the basic farming and animal husbandry sectors. According to statistics, the value of light industrial products of the province's commune and brigade enterprises has increased 13.9 percent over the previous year. The ratio of the value of light industrial products in the gross value of output has risen from 46 to 50 percent, while the ratio of machine processing has dropped from 32 to 23 percent.

With respect to implementing the policy of readjusting the national economy, every area throughout Heilongjiang Province has fully utilized local natural advantages such as mountain forests, grasslands, waters, and farmlands. Suiting measures to local conditions, the various areas, in addition to establishing commune and brigade farming and animal husbandry bases, are encouraging the members to develop family side line production and establish production specialty households and key households which are linked with commune and brigade enterprises in order to supply sufficient raw materials for processing agricultural by-products. At present potatoes, flax, berries, hops, ginseng, edible fungus [Auricularia auricula-judae], mountain wild cabbage, cattle sheep, rabbit, fowls have become the key products of Heilongjiang's commune, and brigade enterprises.

The various areas have emphasized labor intensive-type enterprises, based upon the needs of construction and socialized living of rural villages and small towns. Tertiary enterprises are being developed to improve social services such as eating, housing, transportation, repair and assembly, culture and recreation and sightseeing. At present more than 2,400 social services networks are in existence throughout the province and most of them are additions of recent years. In the readjustment process, based upon the principle of economical reasonableness and mutual benefit, some enterprises of these areas have also implemented various forms of mergers. According to incomplete statistics, at present, the province has more than 300 joint enterprises established by the commune and brigade enterprises.

6168
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BENEFITS OF INCREASED USE OF MACHINES TO SOW CORN OUTLINED

Harbin HEILONGJIANG RIBAO in Chinese 8 May 81 p 2

(Article: "Results of Machine Sown Corn Are Good")

[Text] Corn is the agricultural crop that is planted over the largest area, produces the highest yields and requires the most labor in our province, yet its mechanized operation lacks established experience. Up to the last year, the entire province's machine sown area of corn constituted only 18 percent of the total sowing area. This is unfavorable to our province's development of agricultural mechanization and agricultural production.

Some time ago we organized three joint investigation teams to go separately to the 41 brigades of 29 communes in the 10 [sic] counties of Wuchang, Acheng, Bayan, Suihua, Lanxi, Hailun, Wangkui, Qinggang, Zhaozhou where the area of machine sown corn was larger to conduct special surveys concerning the problem of machine sown corn.

The communes and brigades investigated do not have the same natural conditions and economic conditions and the sowing method and the farm tools used were not all the same, but the survey results showed the results of machine sowing of corn were good.

The group of communes and brigades that have used machine sowing over large areas and have produced increased yields year after year shows such increased yields are not by chance and not local. In this survey, the masses of cadres agree on one basic view regardless of whether the results of machine sowing at the units were good or not very good: Machine sowing truly does have some superior points over sowing corn in small homes, as long as efforts are exerted, there will be no problems in realizing stable and high yields under machine sown conditions. The superior points can be combined into the following three points:

First, machine sowing can plant all of the corn in the high yielding period. According to discussions, many production teams require about one month to plant corn by manual labor. Seeds planted early are surrounded by cold soil and they rust and frequently become powdered seeds. Seeds planted late are surrounded by dry soil and threatened by strong winds, and the more water is applied the later the seeds germinate and even when late seedlings are grasped, the seedlings easily remain green. This way of planting early and planting late is an important reason that the yields of corn of many production teams are not high and not stable. Machine sowing enables one brigade to complete planting in 7 to 10 days, to complete planting with the "waste gap," and its effect of increasing yield is easily seen.

Second, viewing the crop itself, machine sowing completes the five operations of ditching, sowing, fertilizing, covering soil and packing at once and serves to preserve moisture. Machines operate in a regular pattern and generally can seed evenly, cover the soil uniformly, therefore all seedlings "emerge at once." This benefits increased yields of the colony. Machine sowing can hoe the soil relatively deeply, therefore the roots of the plants can grow deeply and the leaves can grow prosperously. These are also important factors to increase the yield of corn.

Third, machine sowing of corn is also less costly. Machine sowing of corn costs only 1 jiao per mu (hand held tractor) and 2 jiao 5 fen (Longjiang No 1) while manual seeding in holes costs 1 yuan 5 jiao.

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JIANGSHAN COUNTY HOUSEHOLDS SPECIALIZE IN PIG RAISING

Beijing REMIN RIBAO in Chinese 11 May 81 p 1

[Text] In Jiangshan County in Zhejiang Province, there are now 40,000 key households and specialized households engaged in raising pigs. They are raising 60 percent of all pigs in the county and constitute an important factor for stable pig production in this county. Last year, the number of pigs raised in the county was 10.6 percent greater than that of the previous year creating the highest record in history. In the first quarter of this year, the number of pigs in inventory continued to rise. The number of pigs raised by the key and specialized households is 16.3 percent greater than the same period of last year. While carrying out the spirit of the party's Third Plenum the concerned members of the Jiangshan County Committee went the more than 30 communes to carry out surveys. They discovered that the potential of raising pigs is very great with the key and specialized households and there is a high rate of commercial products. Last year, the Zhongtou Brigade of Jiepai Commune had 548 publicly owned pigs raised by households and 337 of them were sold to earn more than 23,000 yuan for the collective, amounting to 24 percent of the total income of the brigade. This year it was resolved that key and specialized households would become the major form of extending pig production.

For the purpose of encouraging and supporting such households, a series of measures were adopted by the county committee. For example, all key households raising a certain number of collectively-owned pigs will be provided with a unified amount of capital for piglets as well as the necessary feed and reward. When pigs are to be sold, the pre-agreed weight and cash are to be given to the collective by the household and the portion in excess of the amount is to be kept by the household. For those specialized households who stay home all year long to specialize in raising pigs, the collective will no longer give them labor assignments. Their rewards will be determined by the products of their labor for the year, and they will obtain work-points like all the other members who participate in the collective distribution.

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I. GENERAL INFORMATION

PRESENT STATUS, FUTURE PROSPECTS FOR FORESTRY OUTLINED

Hong Kong CHING-CHI TAO-PAO in Chinese 29 Apr 81 pp 4-6

[Article by Yang Jue [2799 3778], Vice Minister of Forestry, "Present Status and Outlook for China's Forestry Production; Vice Minister of Forestry, Yang Jue, Answers Questions From This Newspaper's Correspondent"]

[Text] Recently a correspondent from this newspaper interviewed Vice Minister of Forestry, Yang Jue. He happily received the correspondent and gave a briefing for readers in China and abroad on the concrete actions to be taken in China's forestry during the period of economic readjustment to improve forestry in the shortest possible time, as well as on the situation and development prospects for forestry production.

Accomplishments in the Building of Forestry

Ever since the Third Plenary Session of the 11th Party Central Committee, the State Council has given fairly strong attention to forestry. In 1978, the State Council made the major decision to build a protective forest system in the 11 provinces and autonomous regions of northeast China, north China, and northwest China in Heilongjiang, Jilin, Liaoning, Hebei, Nei Mongol, Shaanxi, Gansu, Ningxia, Shanxi, Qinghai, and Xinjiang. In 1979, the State Council issued its "Forest Protection Notice" and the Standing Committee of the National People's Congress promulgated the "Forest Law" (draft), designating 12 March as arbor day annually in the Chinese People's Republic. On 5 March 1980, the State Council again issued "Instructions on Vigorous Development of Tree Planting and Afforestation."

Forests are a valuable resource in the national economy. Not only do they provide lumber, energy, and varied forest byproducts, but more importantly, forests play an extremely important role in preserving the natural ecological balance. They are a major requirement for insuring a fine living environment for the people and for consistently high outputs in agriculture and animal husbandry. Forests make numerous contributions to human society. They play an extraordinarily important role in the conservation of water resources, in guarding the soil against erosion, in breaking the wind and holding sandy soil in place, in regulating climate, in reducing pollution, in purifying the area, and in reducing noise. Consequently, planting of trees to create forests and the development of forestry is a basic form of capital construction for agriculture, a strategic measure in improving nature, and a great endeavor of benefit to the present generation and for the prosperity of posterity.

Since the founding of the People's Republic an area of, more than 420 million mu has been preserved through afforestation throughout China, and more than 12 billion trees have been planted in the four besides [beside houses, villages, roads, and water]. Natural replacement and closing of mountains in order to develop forests has been done on 49 million mu. The forest area amounts to 1.63 billion mu, and the forest cover rate has increased from the 8.6 percent of the period immediately following Liberation to 12.7 percent. Everywhere barren mountains have been turned green, deserts have become oases, farmlands have been belted with forests, and trees in the "four besides" have produced shade.

China's forestry industry has also shown steady growth and development. Throughout the country more than 280 large and medium size logging and hauling enterprises have been formed, and the accumulated output of timber over the past 30 years has been close to 900 million cubic meters. Annual timber output has increased from the somewhat more than 5 million cubic meters of the period immediately following Liberation to more than 50 million cubic meters for a ninefold increase. The man-made board industry has developed from scratch to grow large with an annual output of 600,000 cubic meters. Annual resin outputs amounts to more than 200,000 tons, and more than 100,000 tons of it were exported annually for first place in the world. State-owned forest farms now number more than 3,900, operating an area of more than 690 million mu, and having forest reserves of more than 100 million cubic meters. Nationwide, more than 2.1 million people are employed in forestry. There are more than 240,000 people's commune and brigade jointly operated commune-brigade forest farms and timbering farms, and more than 2.5 million specialised teams. The forestry machine industry is in its infancy and able to manufacture numerous kinds of specialised mechanized equipment for forestry use, assuring the needs of building forestry production. Forestry research and educational endeavors have also seen substantial development. There are 549 forestry research units above the county level in the country, employing more than 5,500 scientists and technicians. Numerous achievements have been won in research work. Presently there are 11 forestry academies and 14 secondary forestry schools. During the past 30 years, these have trained almost 120,000 high and secondary forestry graduates.

Growth in the forestry industry has made major contributions to improvement in the natural appearance of China, in assuring agricultural and livestock industry production, in supporting the building of socialism, and in improving the livelihood of the people. However, owing to the evil consequences of longterm destruction caused by the old society, development of China's forestry industry is still relatively backward and far from being able to meet the requirements for building the socialist four modernizations. China is still one of the countries in the world having the fewest forests. It is number 120 among 160 countries and regions in forestry cover rate, and distribution is very uneven. Some provinces in the northwestern region have a forest cover rate that is still less than 1/100. In the more than 2,200 counties throughout the country where tree planting and afforestation has been done well or fairly well, the current rate is also no more than 1/10.

Some Tentative Thoughts on Hastening Forestry Development

China has superior natural conditions for development of forestry. 1. The climate is suitable for the growing of trees and afforestation from south to north. The

tropics are suitable for growth of monsoon forests and rain forests; the semi-tropics are suitable for growth of evergreen forests; the warm zone is suitable for growth of broadleaf forests; the temperate zone is suited for growth of broadleaf forests, and the frigid zone is suitable for growth of coniferous trees. 2. Tree varieties are fairly numerous. Incomplete statistics show more than 2,800 varieties of trees in the country including eight different varieties in the conifer family including metasequoia, silver spruce (*Cethaya argyrophylla*), golden larch, China cypress (*Glyptostrobus pensilis*), Taiwan fir (*Taiwania cryptomerioides* Hay), Fujian pine, *Keteleeria fortunei*, and China fir, which are peculiar to China. Major varieties used for lumber are *Prunus mandshurica*, *Juglans mandshurica*, camphor-wood, nanmu (*Phoebe nanmu*), and mahogany. Major special purpose economic tree varieties include tung, tea, Chinese tallow, lacquer, rubber, and cinchona. 3. China has 1.2 billion mu of barren mountains suited for forests and a large amount of as yet unplanted "four besides."

For the next 20 years, the major task in building China's forestry industry will be vigorous planting of trees and afforestation, and protection of trees to hasten the greening of the motherland, and for steady expansion of large forest resources. At the same time, it will be necessary to strive to increase output of lumber and other forest products in order to meet, to the maximum extent possible, needs for building the four modernizations, and the every growing needs of the people's livelihoods.

As far as planting of trees for afforestation is concerned, in accordance with the spirit of the State Council's "Directive on Vigorous Development of Tree Planting and Afforestation," by the end of this century the forest cover rate should be increased to 20 percent, and preliminary improvements made in the distribution of China's forests. Major matters to be taken in hand include: construction of a 150 million mu shelter forest in North China, the northeast, and the northwest; construction in the north and south of rapidly growing timber forests on 65 million mu, 54 million mu of ligneous forests, 100 million mu of firewood forests, and planting of four besides trees and forest networks around farmlands in plains areas. Existing forces must be conscientiously protected, and mass forest protection and fire prevention work must be intensified for the gradual creation of a modern fire prevention system. Work for the prevention and control of forest diseases and insect pests must be intensified. The natural preserve area is to develop from the present 72 places to 300 places with an area totaling 144 million mu, or one-tenth of the area of the country.

There is need in the forestry industry to hasten the building of new forest areas, while at the same time readjusting the pattern of lumber production, changing the situation of overcutting major forest areas, and gradually achieving all-around management and intensive management so that the green mountains will long remain and continue to be used forever.

1. In accordance with this program, for the next 5 to 10 years, priority should go to build-up of forest areas in the northeast and in Nei Monggol where forest resources are fairly concentrated, and benefits derived from investment are rather good. Forests in the high mountain forest areas of the southwest and northwest are mostly forests for the prevention of erosion and conservation of water resources. Here sensible zoning of forest types should be done, cutbacks made in the

scope of production, and lumber production tasks decreased. In collective southern forest areas, future emphasis should go to development of forest areas along the frontier, and solution to the current problem of overcutting in places where transportation is convenient.

2. Acceleration of the care and transformation of young, sturdy forests. This can increase the amount of growth of forest trees. When tended, about 0.3 cubic meters of timber per mu can be produced. It is planned that by the end of this century, 150 million mu will be tended for an increase in timber output of 45 million cubic meters.

3. Going in big for rapid growth high output forests and building of new commodity timber bases. This is an important way to readjust the distribution of China's timber output and solve the shortage of lumber. China has numerous, fast growing varieties of trees, and natural conditions are good. Southern trees grow particularly fast. Within the next 20 years it is planned to have 65 million mu of newly grown rapid growing high output forests coming to maturity in 10 years, 20 years, and 30 years, and annually providing more than 40 million cubic meters of timber. Additionally 60 million mu of young and vigorous forests with good conditions of local growth, that are in continuous strips, and where transportation is convenient will be selected for the growing of rapid growth, abundant output forests to mature within 10 years. Beginning in 1999, with cutting in turn over a period of 20 years, timber output will be 10 cubic meters per mu for an annual output of 30 million cubic meters of timber.

4. Vigorous development of comprehensive use of timber, development of a man-made board industry, and changing the product structure of forest areas as mostly producers of logs, increasing the timber utilization rate to more than 80 percent. In future, timber processing will come to be done principally in forest areas. The direction of development of cities will principally be further processing of lumber and high quality products. In general, no new lumber processing plants will be built in cities.

Also needed are plans to develop forest output of chemical products such as rosin, shellac, and tannin extract in order to satisfy the needs of both domestic and foreign markets.

5. Trial operation of forestry, industrial and commercial integrated enterprises. This is a means of doing things in accordance with economic laws, and using forests to nurture forests to hasten realization of the four modernizations. In view of the current situation of uneven development of forestry production, the scale and form of organization of forestry, industrial and commercial integrated enterprises may be generally divided into three categories as follows: One is forest farms that are small in area, possess few resources, and are scattered, and forest farms temporarily unsuited to integrated operation where comprehensive forestry, industrial and commercial operations may be conducted within the scope of a single farm. This form is easy to operate, requires little investment, and shows quick results. All forest farms with requisite conditions should, within the next several years, operate integrated forestry, industrial, and commercial enterprises carrying out production, processing, and sales as part of a continuous whole, proceeding from the simple to the complex, and from the small to the big, gradually developing

completeness. Two, is in places where forest resources are concentrated in continuous tracts and where there are a lot of forest farms. Various individual forest farms may be organized in integrated forest, industrial, and commercial enterprises with benefits for better building of forestry bases and accelerating realization of modernization of forestry production. However, such investment is required; much equipment is needed, and such enterprises may presently be developed only in key places. Three, is one or several forest farms with substantial resources, or forestry bureaus cooperating with non-forestry units to form integrated enterprises and run joint resources operations in which forest farms are paramount, with forestry departments providing resources and workforce, and other units providing facilities and skills, raw materials being allocated on the basis of internal prices, and profits being proportionately divided. The aforesated three forms of forestry, industry, and commerce should accomplish gradual growth in forest area, reserves, output value, and profits. Right now, state-owned forest farm integrated forest, industrial, and commercial enterprise pilot projects are being carried out in the 14 provinces and autonomous regions of Sichuan, Shaanxi, Gansu, Hubei, Hunan, Guangxi, Jiangsu, Zhejiang, Fujian, Hebei, Shanxi, Liaoning, Jilin, and Heilongjiang.

Major actions in Preliminary Ideas on Forestry Development

In order to assure realization of the aforesated plans, we are now in process of adopting the following measures:

(1) Readjustment and implementation of forestry policies

It takes a long time to get a return from forestry production, and forestry has a lot to do with society and the public welfare, and thus it very much requires reliance on policies to arouse the enthusiasm for planting trees and afforestation on the part of the broad masses of people and every trade and industry in a real running of forestry by the state, the collective, and individuals.

In rural villages, particularly in plains areas that lack forests or have scant forests, depending on circumstances, suitable increase should be made in the planting of trees in front of and behind the homes of commune members, and at places designated for the planting of trees by production teams. Rural people's communes and production brigades should, to the full extent of their abilities, collectively afforest barren mountains and wastelands. Communes and brigades having substantial barren mountains and wastelands can zone suitable amounts of privately cared for mountains for the planting of trees and afforestation by commune members. Mountain rights to the privately cared for mountains will still belong to the collective, but benefits from forest wood and forest products will belong to individuals.

When water conservancy, agriculture and land reclamation, transportation, railroad, coal, light industry, and urban construction, industries and units plant trees and afforest, funds provided by individual units will be used by those who provide them. Forestry departments will provide technical guidance. The state also proposes various forms of joint afforestation to be undertaken by one department and another, by the state and collectives, and by one collective and another with benefits being divided proportionately.

State-owned forest areas should conscientiously adhere to the principle of "three concurrent concerns," bringing into forestry production and construction activities masses of commune members and communes and brigades in forest areas, and paying economic remuneration. They may also sign agreements with rural people's communes and production brigades, cooperate in afforestation, in caring for forests, and in transforming low output forests with benefits being proportionately divided. They may also develop timber processing in concert with communes and brigades in forest areas, and engage in multiple use and diversification with them. They may also adopt the method of linking state enterprises with communes and brigades, and engaging in compensatory trade with cities lacking timber, using the cities' funds and equipment for processing and using timber in multiple ways in forest areas.

(2) The state will provide longterm economic protection and support to forestry.

This is a common experience in countries of the world that are advanced in forestry. China's task of afforestation and making the country green is great, and the collective experiences of rural people's communes and production brigades is weak. In addition, benefits from afforestation are slow in coming, so afforestation would be difficult to realize without economic support from the state. But in what areas should support be provided? Needed is a sensible readjustment of grain purchase and sales norms in collective forest areas, and institution of a guaranteed policy of no change for several years, guaranteeing that grain consumption standards for communes in forest areas will be no lower than for commune members in nearby grain producing areas. There is need to readjust policies on timber prices, and need to increase forestry capital and establish a forestry fund system. As the national financial and economic situation improves, for the next 20 years the amount of investment in forestry should gradually be increased.

(3) Strict laws to protect forests

In a situation of scant forests in China, there is special need to strengthen the legal system and use laws to regulate forests. We are in process of making further revisions in the "Forest Law" (Trial), but until the state formally promulgates it, there must be resolute, conscientious, and thorough implementation of the "Forest Law" (Trial). The "Forest Law" (Trial) was published more than a year ago, and the masses should be aroused to diligently check on cases involving destruction of forests, and handle them strictly in accordance with their seriousness. At the same time, for those areas, units and units that protect and manage forests well, and for those meritorious individuals who protect forests, strong efforts should be made to award commendations and offer rewards for gradual creation of a new social ethic in which protection of forests is glorious and destruction of forests is shameful.

(4) Strive to do a good job in forestry research and education for rapid modernization of forestry.

Science and technology are productive forces. In order to accelerate the pace of the building of forestry in China, science and technology must play a vanguard role. Along with reforms in China economic system must go further reforms and perfection of the management system, and organizational leadership in forestry research. Forestry research must be better linked with production and teaching to

promote modernization of forestry science and technology, and to hasten the pace of the building of forestry. For the next 10 years, the emphasis of forestry research should be on solution to the problem of rapid-growth, and abundant output forestry techniques, afforestation techniques for the "three norths" shelter forest, comprehensive measures for forest protection, and new techniques, new technology, and new equipment for increasing the multiple utilization rate for timber. For these purposes, scientific research ranks must be enlarged, scientific instruments and equipment increased, research organizations readjusted on the basis of natural zones, comprehensive arrangements adhered to, key points strengthened, the pattern of distribution made reasonable, and the activist spirit of both the central government and local governments carried forward for a forestry system that will be rationally distributed, all parts receiving proper emphasis, and work divided for cooperative efforts as the nation gradually builds specialized accompaniments.

Education is the foundation of science. On the basis of forestry research and the development of production over the next 10 years, the foundation for our forestry education endeavors is still weak. Faced with this fact, institutions of higher and secondary learning should readjust, improve, and make the most of untapped potential for steady development. Forces should be concentrated for operation of key forestry institutions, making educational and research centers of the Beijing Forestry Academy, the Northeast Forestry Academy, and the Nanjing Forest Production Industrial Academy. In existing forestry academies (or departments) further staffing of instructors should be done, the quality of instructors improved, a good job done with teaching materials, teaching facilities augmented, specialized curricula readjusted, and all forestry institutions operated as distinctive, all around or specialized forestry institutions. Half work half study forestry schools and technical schools should also be operated to train personnel possessed of rudimentary techniques and technicians. Training should also be given forestry cadres on the job to raise their scientific, cultural, profession, technical, and administration and management levels to meet the needs of the building of the four modernizations.

9432
CSO: 4007/435

Agricultural Experiments

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TITLE: "Preliminary Investigation of High Yield Cultivation Technique of Direct Seeding of Rice After Wheat"

SOURCE: Huanggang HUBEI NONGYE KEXUE [HUBEI AGRICULTURAL SCIENCES] in Chinese No 5, May 81 pp 1-6

ABSTRACT: The technique of direct seeding of rice is often adopted in regions of one crop of rice per year and in some regions, the use of airplanes for seeding and management has also been developed, but there has yet been no report of systematic study on applying the technique in regions of two crops of wheat (or lima bean) and rice. Guanzhuanghu Farm is located in 31°16' N, on a plain of 46 m in elevation, with 250-270 days of frost-free period a year. In 1980, an experiment was carried out for the purpose of resolving problems of breed, seeding method, and the quantity of seeds used for direct seeding of rice after the wheat harvest. This paper reports the results of the experiment in terms of the growth and development characteristics of the rice, the yield and other characteristics of the 7 breeds used in the experiment, and comparisons of the 3 methods of seeding and the 4 quantities of seeds used.

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TITLE: "Report of 1980 Experiment With Rice Intercropping Rice In Hubei Province"

SOURCE: Huanggang HUBEI NONGYE KEXUE [HUBEI AGRICULTURAL SCIENCES] in Chinese No 5, May 81 pp 6-9

ABSTRACT: In recent years, about 14,000,000 mu of dual season rice is being cultivated in the province and close to 40 percent of this acreage must be transplanted as late as the first ten-day period of Aug. For more than 1,000,000 mu late rice, transplant is sometimes as late as 7 August and the delay causes the yield to be as low as 200 jin/mu. In years of early autumn cold weather, there may be no harvest at all. According to experiments in Jiangsu Province as well as in Hubei, the technique of rice intercropping rice is effective for resolving this problem. In 1980, the division organized an experiment in several brigades to test (1) Transplanting hybrid rice on 3-13 Jul in paddies in which late rice has been seeded on 10-20 Jun to grow seedlings; (2) Seeding late rice on 20 Jun in previously prepared rows in paddies in which the first rice crop still has about 30 days to grow. The major management technique and important problems to be further studied are discussed.

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TITLE: "Meteorological Ecology of Summer Corn In Northern Hubei and the Suitable Planting Time"

SOURCE: Huanggang HUBEI NONGYE KEXUE [HUBEI AGRICULTURAL SCIENCES] in Chinese No 5, May 81 pp 12-14

ABSTRACT: Meteorological data of the farm's weather station in the past 24 years (1957-80) are used in conjunction with the experimental cultivation results of corn at the farm in the last 2 years to study the weather condition and ecological relationship of summer corn and its safe heading and blooming time for the purpose of determining the time range in the summer suitable for planting. The weather characteristics during the growth and development period of summer corn, the frequency of drought occurrence during the heading and blooming time of summer corn, the number of days of growth and development when several local breeds are planted on different dates, etc. are reported. Summer corn may be planted 10-25 May, following the harvest of barley (rape) or between 30 May to 10 Jun following that of wheat. In the latter case, the probability of drought injury at heading time is 37.5 percent, allowing 54 days for growth and development. It is the conclusion of the study that the risk will be much too high if planting is delayed to as late as 10-20 Jun.

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TITLE: "The Breeding Process of the New Cotton Variety 72-22-28 and Its Essential Techniques of Cultivation"

SOURCE: Huanggang HUBEI NONGYE KEXUE [HUBEI AGRICULTURAL SCIENCES] in Chinese No 5, May 81 pp 14-15

ABSTRACT: The new cotton variety 72-22-28 is bred out at the center through selection from offsprings of F_4 hybrids in a project launched in 1976. Production demonstration in 20,000 mu was carried out in 1981 in more than 20 counties in the province. Under arid, humid, and normal weather conditions, it always manifested early maturing, superior cotton quality, high yield, and adversity resistant characteristics. Its accumulated temperature requirement is 3,255-3,289°C. The growth and development period is rather short to make it suitable for dual crop system of wheat and cotton. Detailed observation data are reported.

6168

CSO: 4009/338

Agricultural Sciences

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TITLE: "Identification of Resistance to Yellow Dwarf Virus of Wheat Breeds"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 5, May 81 pp 6-7, 24

ABSTRACT: Wheat yellow dwarf disease (BYDV) is an epidemic virus disease, disseminated by wheat aphids. The disease was first reported in 1951 in the USA. In China, the first serious epidemic occurred in 1960, and incidences of various degrees of severity have been reported every year since then. In Shanxi the loss to wheat yield from each incidence is estimated at 20-30 percent. For the purpose of finding resistant breeds, in 1973-80, 710 wheat breeds were inoculated and field survey work was also carried out to identify resistance to this disease. Theoretically speaking, the work of clarifying the strain of virus and special modes of spreading should be accomplished before the identification of resistance. The method of using mixed aphid colonies for inoculation is adopted to minimize this shortcoming. Future experimental data are needed to prove the adequacy of the method. Wheat breeds of relatively good resistance identified during these years are reported. Judging from the uniform characteristic of resistance to the disease of parents (mainly the female parent) and the offsprings, this type of resistance may be said to be inheritable.

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TITLE: "Yield Structure of Summer Planted Wheat"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 5, May 81 p 8

ABSTRACT: For the purpose of determining the optimal time, quantity of seeds, and fertilizer application method for summer planted wheat, a test project was carried out in experimental fields at 3 places with varying planting dates of 10, 14, and 18 of Jul, quantities of seeds of 35, 40, and 45 jin/mu, and fertiliser applications of 30-30 and 10-20 jin of ammonium nitrate. Results in yield per mu, number of spikes per mu, number of grains per spike, test weight per 1000 grains, and dry substance distribution ratio of various parts of the wheat plant are reported. These results demonstrate that under the natural ecological condition of above 1,000m in elevation, summer planted wheat can grow and develop normally to head and ripen, and the yield may be relatively stable, at an average of 179 jin/mu. In the future, with winter wheat in the paddies of Shanxi, summer planted wheat may be extended in dry fields and hilly and mountainous regions of the province. At present, problems of insufficient adversity resistance, underdeveloped root system, small leaf-area, etc. of local breeds are preventing summer planted wheat from yield increase, however.

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TITLE: "Research on Industrialised Seedling Culture for White Cabbage"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 5, May 81 pp 9-10

ABSTRACT: In cultivating white cabbage, virus damage to seedlings is difficult to prevent because of the high temperature, aridity, and aphids during the seedling stage. An experimental technique of growing seedlings in greenhouses was conducted in 1979-80 and the results were very satisfactory. The plant is simply constructed and generally, for a brigade growing 200 mu of white cabbage a year, a plant of 200 m² of floor space is sufficient to supply the needed seedlings. Green colored plastic screen is installed on all windows and doors to prevent all flying insects from entering the plant. The required equipment, the method of providing the greenhouse with automatic watering and temperature regulating systems, the growth of seedlings in the greenhouse, compared with seedlings grown exposed in open seedbeds, and other data of the experiment are reported.

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TITLE: "An Experiment to Study the Correspondence Between the Progress of Spike Esvolvement and the Leaf-age Index"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 5, May 81 pp 11-12

ABSTRACT: It is believed that with regard to the development of individuals of herbaceous crops, such as corn, spring wheat, millet, etc. the external morphology may be used to determine the extent of evolvement of the spike for the purpose of directing field management. Leaf-age means the number of opened leaf-blades and the extended portion (expressed in a fraction) of the leaf above the fully extended one. Leaf-age index = $\frac{\text{Leaf-age}}{\text{number of leaf-blades}} \times 100$. Spikes of several breeds of corn, spring wheat, and millet were randomly taken every other day and observed under the microscope and the degree of evolvement of the spike on the main stem and the leaf-age, the length of the root, the number of roots, the height of the stalk, etc. at the time when the spike specimens are taken are recorded. The observed relationship between the leaf-age, the leaf-age index, and the extent of evolvement of the spike of corn, spring wheat, and millet is reported in separate tables in the paper.

Botany

AUTHOR: ZHOU Chang [0719 1281]
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TITLE: "In Vitro Embrogenesis in Unfertilized Embryo Sacs of Oryza sativa L."

SOURCE: Beijing ZHIWU XUEBAO [ACTA BOTANICA SINICA] in Chinese No 3, May 81
pp 176-180

TEXT OF ENGLISH ABSTRACT: Haploid rice plantlets were induced from cultured ovaries in our previously reported experiment. The present paper is an embryological study on this subject.

Young flowers of two japonica cultivars were excised and cultured in exactly the same manner as before. The liquid medium used for float culture was N6 + 3 percent sucrose + 0.125 ppm MCPA. The inoculated materials were checked for being at the late uninucleate pollen stage which corresponded mainly to the uninucleate embryo sac stage, and some two- or four-nucleate embryo sacs as well. Samples were fixed at two to three day intervals in aceto-methanol (1:3), stained in toto with diluted Ehrlich's hematoxylin and sectioned by paraffin method for microscopic observation.

Four days after inoculation most of the embryo sacs developed up to an eight-nucleate stage with polarized differentiation of the egg apparatus, central cell

[Continuation of ZHIWU XUEBAO No 3, May 81 pp 176-180]

and antipodals. From the seventh day on, proembryos of various sizes and shapes appeared in the micropylar region of some embryo sacs; some consisted of meristemic cells while others were highly vacuolated. One-celled as well as linear multicellular suspensors atypical of in vivo zygote proembryos were observed. However, it was uncertain whether the proembryos originated from the egg cell, the synergids, or the differentiation egg apparatus as a whole. Another peculiar event occurring during culture was the formation of endosperm-like free nuclei from the unfertilized polar nuclei in some embryo sacs. Sometimes the free nuclei were numerous and showed a tendency toward cell formation in localized areas. Twelve to fifteen days after inoculation, the proembryos developed into microscopic calli with globular or pearlike shapes, which continued to enlarge to a size visible to the naked eye at about the 18th to 24th day. Further growth eventually led the calli to protrude from the ovary wall beyond the 32nd to 35th day.

These observations indicate that the embryo sac, similar to pollen, can be induced to embryogenesis in vitro. This may open a new way to study the mechanism controlling gametophytic and sporophytic developmental pathways of embryo sacs and provide a means for large-scale production of "embryo sac plants" in the future.

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TITLE: "Anatomical Observation of Assimilating Branches of Nine Xerophytes in Gansu"

SOURCE: Beijing ZHIWU XUEBAO [ACTA BOTANICA SINICA] in Chinese No 3, May 81
pp 181-185

TEXT OF ENGLISH ABSTRACT: The nine xerophytes grown in Gansu, i.e., Haloxylon persicum Bge., H. ammodendron Bge., Calligonum junceum Litw., C. arborescens Litw., C. leucocladum Bge., C. mongolicum Turcz., C. caput-medusae Schrenk, Hedysarum scoparium Fisch. et Mey. and Limonium aureum Hill., all, especially Haloxylon persicum, possess distinct structural features of xeromorphism. Generally their leaves are extremely degenerated or exist as basal leaves. Photosynthesis is carried out by the young green twigs, the epidermis of which has thickened cell walls overlaid with thick cuticle. Underneath the epidermis is the hypodermis. Next to the hypodermis, the well-developed palisade layer is shown to have cells containing abundant chloroplasts. Water-storing tissues with large cells are seen central to the palisade tissue. In transverse section, the ratio of the cortex width and stem diameter is greater than that of mesophytes. In contrast, the ratio of cortex width and root diameter is smaller. Crystal

[Continuation of ZHIWU XUEBAO No 3, May 81 pp 181-185]

cells or mucilage cells, probably with xeromorphic characteristics, are generally present in these xerophytes.

9717
CSO: 4009/335

Natural Resources

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TITLE: "Discussion on the Principle and System of Land Resource Classification in China"

SOURCE: Beijing ZIRAN ZIYUAN [NATURAL RESOURCES] in Chinese No 2, Jun 81 pp 1-6, 64

ABSTRACT: In Aug 79, the Natural Resources Comprehensive Survey Committee Chinese Academy of Sciences was asked by the National Agricultural Committee to invite related scientists to draft a set of principles for compiling the 1:1,000,000 Land Resources Map of China. In the draft, the land of China is divided into 11 natural regions, and each region is further divided into 8 classes. There appears to be a confusion between the geographical concept of regionalization and the concept of classification of soil geography. Discussions at the 1975 conference of FAO are mentioned to support the author's viewpoint that to be scientific, the principle of land resources classification must be an evaluation of suitability and limitation. While on the one hand a piece of land may be said to be suitable for agriculture, or forestry, or animal husbandry, every piece of land is also suitable for more than one use. Limitation factors, also called the diagnostic index, in-

[continuation ZIRAN ZIYUAN No 2, 1981 pp 1-6]

clude natural factors as well as social and economic factors. In the vast territory of China, there are great differences in cultivation and management levels, and transportation facilities, the size of the market, etc. should also be at least taken into consideration. Based upon this system of land resources suitability evaluation, the paper suggests a 4-level classification method to classify various lands according to the purpose they may be used as well as the factors limiting their use.

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TITLE: "Preliminary Study on Rational Land Utilization in Sichuan Province"

SOURCE: Beijing ZIRAN ZIYUAN [NATURAL RESOURCES] in Chinese No 2, Jun 81 pp 22-30

ABSTRACT: Of the 5,670,000 km² of land in Sichuan, 11.78 percent is cultivated (100,290,000 mu); forest and grassland amount to 67.28 percent; and only 1.67 percent is water. Following a geographical description of the province and a discussion of current conditions of land utilization, the paper suggests that (1) the vast areas of mountains and steep slopes of the province are urgently in need of reconstruction to readjust the soil, water, and forest conditions in order to prevent further deterioration of production conditions. (2) The winter paddies of the basin is used mostly for one crop of intermediate rice, while the light and temperature conditions are not fully utilized. Instead of prolonged all winter soaking, engineering projects should be constructed to move the water of the western mountains to the east for irrigation. Ways of developing the mountains to provide timber and exterminating the rodents on the 20,000,000 mu of grassland of the northwestern part of the province to guarantee a rapid expansion of animal husbandry are also proposed.

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TITLE: "On Rational Regulation Storage of Water and Comprehensive Transformation of Dry, Waterlogged and Saline-alkaline Soils in the Huang-Huai Plain"

SOURCE: Beijing ZIRAN ZIYUAN [NATURAL RESOURCES] in Chinese No 2, Jun 81 pp 31-40

ABSTRACT: The Huang-Huai Plain is on the south side of the lower reaches of Huanghe, formed by the alluvium of Huanghe and Huaihe. On the basis of its natural geographical characteristics, this paper is a preliminary investigation of the relationship between several local forms of water storage and comprehensive improvement of the dry, waterlogged, and saline-alkaline soils. As ground water resources can only supply half of the irrigation needs, various ways of conserving and storing surface water are proposed. The water storage and irrigation practices of the 50's and 60's failed to consider drainage. This neglect has caused serious rise of ground water table and large areas of secondary salination. Drilling wells and digging drainage ditches are effective measures of remedy. Successful projects of several communes to combat the problem of water and improve the soils are described.

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TITLE: "Estimation and Analysis of Surface Runoff in Northwest and North China"

SOURCE: Beijing ZIRAN ZIYUAN [NATURAL RESOURCES] in Chinese No 2, Jun 81 pp 41-49

ABSTRACT: The climate of Northwest and North China is arid. Precipitation varies a great deal from year to year, while within a year the distribution is not even. Most surface streams have already been used to irrigate existing crop lands. According to a 1973 statistics, the 47,400,000 mu of cultivated land were using up 70 percent of the total stream flows of all Xinjiang, while there are 2,300,000,000 mu of arable wasteland waiting to be developed. Following a region by region estimate of surface runoff, based upon statistical data of 1957-1977, the paper concludes that the surface runoff of the month of greatest needs amount to 8.9 percent of the total runoff of a year, and the runoff of a wet year is 3.2 times that of a dry year. There is, therefore, still room for raising the utilization coefficient to gradually regulate and adjust the water supply within a year as well as among several years.

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TITLE: "On the Relationship Between Climatic Characteristics and Productions of Agricultural, Forestry, and Animal Husbandry in West and North China"

SOURCE: Beijing ZIRAN ZIYUAN [NATURAL RESOURCES] in Chinese No 2, Jun 81 pp 50-60

ABSTRACT: West and North China in this paper refer to the Nei Menggu Plateau, the loessial plateau, the Qinghai-Xizang Plateau, and the Tarim and Junggar basins of the south and the north of Tianshan Mountains. The average elevation of the southwestern part of the region is above 4000m; in the northeastern part it is generally 800-1000m. Obvious variations of climate and terrain provide the basis for multiple development of agriculture, forestry, and animal husbandry while the abundance of daylight is a natural energy resource. The favorable and unfavorable climatic conditions of the region are examined and based upon the geographical and environmental characteristics, directions of development of the various areas of the region are proposed.

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TITLE: "On the Breed Resources of Swine in China and Their Perspective"

SOURCE: Beijing ZIRAN ZIYUAN [NATURAL RESOURCES] in Chinese No 2, Jun 81 pp 65-71

ABSTRACT: China has had a history of swine culture of 7000-10000 years. While there are only 300 plus breeds of swine in the world, according to incomplete statistics, China has 153 local breeds. Aside from the cold region of the USSR, the fatty type swine breeds are almost extinct in the rest of the countries of the world, but there are still several breeds containing more fat and less lean meat than the world standard but the 10-month old porkers of these breeds make supergrade bacon. The variety of natural geography, economic condition, natural climate, agricultural production condition, feed supply, management style, and special taste of the people of all the localities of the vast territory of China have caused the development of special types of swine, impossible to be classified according to principles of other countries. The paper suggests that swine breed resources of remote border regions of China are in need of further study, some identical breeds of different names should be clarified. The history of formation of a breed, its ecological environment, and social economic conditions should also be studied in addition to morphological and physiological descriptions so that the data may be gathered and maps compiled to guide planned improvement and/or preservation.

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ABSTRACT: This paper proposes an overall and objective estimation and evaluation of animal husbandry resources in China to determine the merits and potentials for the purpose of formulating a direction of development and an economic policy of animal husbandry. Animal husbandry resources include feed resources, breed resources of domesticated animals, and resources of animal husbandry labor. Feed resources are further divided into the cultivated feed, natural grassland, and industrial processed feed. Breed resources of domesticated animals include the breed varieties and the number and size of the herds. Each of these items is briefly examined in the paper.

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